

TOY TRAIN TRACK ADAPTER

Field of the Invention

[0001] The present invention relates generally to hobby toys and, in particular, to the use of toy train tracks with different types of toy trains and
5 other vehicles.

Background of the Invention

[0002] Toy trains, in particular electric toy trains, are well known in the art. A typical toy train track layout will generally comprise multiple track segments that, when connected together, will form at least one loop or circuit.
10 The track segments are generally comprised of two or more rails fastened to a plurality of railway ties. The railway ties serve to maintain the rails in a pre-determined, spaced-apart relationship, thereby defining a particular gauge of model railroad. To ensure both electrical and physical continuity, as well as to ensure proper alignment of the rails between adjoining track segments,
15 connectors are used. For example, with O27 and O gauge tubular track manufactured by Lionel LLC, the connectors are pins that friction fit into each of the adjoining rail segments. Due to the variety of manufacturers and model railway gauges available to the industry, the configuration of the connectors will vary, but their primary function remains the same.

20 [0003] Electric toy trains employ an engine car, generally referred to as a locomotive, comprising at least one electric motor that draws power from the rails of the track. In the industry, there are two generally accepted formats of track, one being referred to as 2-rail, the other being referred to as 3-rail. With 2-rail, one rail serves as a power rail, while the other rail serves as the
25 reference. The wheels of the locomotive serve as contacts, thereby completing an electrical circuit for powering the electric motor contained therein. For 3-rail, a center rail generally provides the power, while two electrically contiguous outside rails serve as the reference. Locomotives generally have an electrical pick-up means, for example a shoe or roller, that contacts the center rail, while
30 the wheels of the locomotive or rolling stock serve to complete the electrical

circuit by contacting the outside rails. Power is generally applied to the rails by way of a transformer that converts standard household power (i.e. 120V) to an appropriate and safer voltage range for use with toy trains (i.e. 0 to 25V).

5 **[0004]** For younger children, electric toy trains can present certain difficulties with respect to operation. In particular, some trains are difficult to mount on the rails where failure to do so generally results in potentially hazardous electrical shorts. Consequently, the suitability of electric toy trains for use by young children is often questioned.

10 **[0005]** Conventional toy train track is designed for operation of a specific "gauge" of toy train, the gauge being defined by the distance between the rails, or, in the case of 3-rail, the outside rails. Examples of popular gauges for toy trains include N, Z, HO, O27/O and Standard. There are numerous manufacturers that produce track segments, trains and accessories, with Lionel LLC, MTH Trains and K-Line being popular manufacturers for O27/O gauge.

15 Depending on the gauge and the extent of the track layout, track layouts can potentially occupy a large amount of space that, by design, is devoted to operation of only a specific gauge of toy train. Many of these track layouts are permanent and, therefore, require a dedicated space. Often, such tracks are secured to a surface such as plywood boards in order to further stabilize the

20 track layout. Due to the inherent hazards discussed above with respect to electric toy trains, such a space is generally unusable for a younger child without adult supervision or assistance. While the electricity that powers such tracks can be turned off, trains designed for powered motion are usually unsuitable as "push" toys. Further, some electric train locomotives can be

25 damaged when being manually urged along the track.

30 **[0006]** For younger children, there are a number of battery-operated or non-powered toy trains available that operate on wooden or plastic track. Popular examples include those manufactured by the Brio Corporation as well as Thomas and Friends by Learning Curve International Inc. The track segments used with the above battery-operated or non-powered trains generally have channels for receiving and guiding the wheels of the train. In some cases, the tracks may also be used with non-train vehicles (i.e. trucks,

cars, etc.), depending on the product line of the manufacturer. As is the case for conventional electric toy trains, the track for the battery-operated and non-powered trains is gauged specifically for use with these toy trains.

5 **[0007]** As indicated above, toy train track has traditionally been manufactured for a specific gauge of toy train. Overlap between the gauges where multiple gauges use the same basic track has not been previously contemplated. For multiple gauge operation, the only solution has been to build separate layouts. For many, due to space constrictions, this may not be possible.

10 **[0008]** It is therefore an object of the invention to provide a novel toy train track system and adapter.

Summary of the Invention

15 **[0009]** The present invention allows toy train tracks designed for use with a specific type of train to be used with other types of vehicles, including, but not limited to, other trains and cars. The adapters can be designed to permit the toy train track to be used with trains of a specific wheel configuration for which the track was designed and vehicles having another wheel configuration without removal of the adapters from the train track. Alternatively, the adapters can be made to be placed onto and removed from the toy train track, thus allowing the utility of the track to be switched.

20 **[0010]** With the invention, one track can be used with a variety of vehicles, thus reducing the need to disassemble the track when not in use. Further, the adapters can be made relatively cheaply, thus providing inexpensive additional functionality to an existing train layout. Still further, by enabling the use of other vehicles with the train track, electricity can be disconnected from the train track, thus providing a safer play environment for younger children.

25 **[0011]** Additionally, the train tracks can be made with one or more travel surfaces between or adjacent the rails to permit vehicles having various wheel configurations to be used in conjunction with the train track.

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Brief Description of the Drawings

[0012] Preferred embodiments of the present invention will now be described, by way of example only, with reference to the attached Figures, wherein:

5 Figure 1 shows an isometric exploded view of an electric toy train being placed on two joined 3-rail track segments;

 Figure 2 shows an isometric sectional view of the 3-rail track of Figure 1;

 Figure 3 shows a front view of the electric toy train of Figure 1
10 fitted on the track;

 Figure 4 shows an isometric exploded view of another toy train being placed on two adapters that are being fitted in one of the track segments of Figure 1;

 Figure 5 shows a front view of the toy train and adapters of Figure
15 4 fitted on the track of Figure 1;

 Figure 6 shows a front exploded view of the adapters of Figure 4 being fitted on the track of Figure 1;

 Figure 7 shows a bottom perspective view of the adapters of
 Figure 4;

20 Figure 8 shows a perspective sectional view of an alternative track having a set of channels between the two outer rails;

 Figure 9 shows a front view of the track of Figure 9 illustrating the placement thereon of wheels of an electric train and another vehicle; and

 Figure 10 illustrates a front view of an alternative adapter fitted on
25 the track of Figure 1.

Detailed Description of the Invention

[0013] Various aspects of the invention are described in detail where it is appreciated that the principles of the invention, as established in the detailed description of the drawings, may find application for use with toy trains. This
30 invention relates to an adapter and system that permits a toy train of a

particular gauge to use the tracks of a toy train having a different gauge, thus providing increased play value out of a track layout. More specifically, a first, larger gauge of toy train track is fitted with adapters in accordance with an embodiment of the present invention. This allows for the unimpeded operation of trains of either the first, larger gauge, generally being electric toy trains, and a second smaller gauge, generally being battery-powered or non-powered. Due to the variety of toy train gauges available, for exemplary purposes, the present invention will be discussed using O27/O gauge tubular track manufactured by Lionel LLC.

10 **[0014]** Figures 1 to 3 illustrate typical 3-rail toy electric train track segments 20, each of which comprises two outer rails 24 and a center rail 28 secured to a set of railway ties 32. An engine 21 coupled to rolling stock 22 is shown being placed on the track segments 20.

[0015] Figures 2 and 3 better illustrate the profile of the rails 24, which for the purpose of this discussion are virtually identical to rails 28 in construction. The rails 24 of a track segment 20 are made by crimping long rectangular metal plates along their length at portions 36 to create tubular portions 38 having rolling surfaces 40. A pair of flanges 44 is formed on each track segment 20 by bending the longitudinal edges of the metal plate such that they are generally perpendicular to the crimped portions 36.

[0016] The rails 24, 28 are shown secured to the railway ties 32 using tabs 48. The railway ties 32 are generally made from stamped metal with the tabs 48 being integral and unitary with the railway ties 32. The tabs 48 engage the outside rails 24 by directly clamping over the flanges 44. This establishes electrical continuity between the outside rails 24 due to the use of metal railway ties 32. To electrically isolate the center rails 28 from the outside rails 24, and thereby to prevent a short, insulating layers 52 are inserted between the flanges 44 of center rails 28 and the tabs 48. In operation, a voltage is applied to the center rails 28 with the outer rails 24 serving as the reference. The electrical continuity between the outside rails 24 simplifies the wiring for powering the track as only two leads are required from the transformer, one being the power

lead connected to the center rails 28, the other being the reference lead connected to the outside rails 28.

[0017] To assemble the track segments 20 together to form a layout, pins 56 positioned within the tubular portion 38 of adjacent track segments are used. While the pins 56 may be retained in place by friction fit, the track segments 20 are generally supplied with a set of pins already mounted on one end of each rail 24, 28 of the track segment 20. In this case, the pins are usually "pinched" in place. During assembly, the pins 56 projecting from one end of the rails 24, 28 of a first track segment 20 are used to connect the first track segment 20 with a second track segment 20 by mating the pins with the respective tubular portions 38 of the second track segment. The pins 56 are usually friction-fit into the unoccupied ends of the tubular portions 38 of the second track segment 20 to releasably hold the two train track segments 20 together.

[0018] Figures 4 to 7 show a pair of adapters 100 for use with the train track segments 20. Each of the adapters 100 is generally rectangular when viewed from above and has an outer side 104, an inner side 108, a first end 112 and a second end 116. Presently, the adapters 100 are constructed of injection-molded plastic, but other suitable materials will occur to those of skill in the art. The adapters 100 are placed between one of the outer rails 24 and the center rails 28 of track segments 20, with the outer sides 104 adjacent the outer rails 24 and the inner sides 108 adjacent the center rails 28.

[0019] Each of the adapters 100 has a support surface 120 along its bottom for supporting the adapter 100 on the railway ties 32. The support surface 120 has a set of smaller cutouts 124 for receiving the tabs 48 clamped over the flanges 44 and a set of larger cutouts 128 for receiving the tabs 48 clamped over the insulating layer 52 and the flanges 44.

[0020] An upper surface 132 is provided on each adapter 100, having a travel surface 136 and a guiderail 140 adjacent the travel surface 136. Both the travel surface 136 and the guiderail 140 extend along the length of the adapter 100. When the adapters are placed between the outer and center rails 24, 28, the travel surfaces 136 sit recessed relative to the outer rails 24 and the

guiderails 140, thus defining channels that confine lateral movement of sets of wheels of a vehicle placed on the adapters 100. According to one embodiment, the travel surfaces 136 are provided with a textured surface to provide both aesthetic detailing as well as traction to wheels of the vehicle
5 when moving along the travel surfaces 136.

[0021] In operation, two adapters 100 are placed in the spaces between each of the outer rails 24 and the center rail 28 of each adapter 100, with the two guiderails 140 being positioned closest one another. In this orientation, the travel surfaces 136 are adjacent the outer rails 24. The adapters 100 are
10 dimensioned such that the upper surfaces 132 do not interfere with wheel flanges and other structural members of trains (or other vehicles) designed for operation on the train track segments 20.

[0022] A toy train track layout fitted with the adapters 100 can be used with both a first toy train for which the track was originally gauged for, as well as
15 a second toy train or other vehicle of a smaller gauge. Where the first toy train is an electric train, the train track can be operated as usual under power from a transformer. When the track layout is to be used in conjunction with the adapters to permit the second toy train of a smaller gauge to be placed thereon, the electricity can be turned off. The adapters 100 allow a traditional electric
20 toy train layout to be converted for use with both the trains for which it was originally designed, as well as with battery operated or non-powered trains or other vehicles of smaller gauge that are generally safer and easier to use by younger children.

[0023] While the invention has been described with reference to 3-rail track, use of the present invention with other types of tracks will occur to those
25 of skill in the art. For example, a single adapter can be employed with 2-rail track to provide the same functionality. Such an adapter would have the same general features described above with one or more guiderails residing between the sets of wheels of a vehicle placed thereon.

[0024] Figures 8 and 9 show an alternative embodiment, where the
30 adapters of Figures 4 to 7 are integrated into a molded roadbed that replaces the railway ties. Where the molded roadbed is made from a material having

less than desired conductivity, the molded roadbed can be provided with contact strips to ensure electrical continuity between the outside rails, so as to not affect operation of electric toy trains on the rails of the track. By incorporating the adapters into the roadbed, a total cost savings can be realized, while also providing greater flexibility with respect to utility of the track. For example, track of this embodiment can be sold as a set where both a battery-operated and an electric train are provided, the child learning to operate toy trains using the more child-friendly battery train, while graduating to the electric train upon achieving a suitable level of maturity and/or once familiarized to the hobby. The set would also demonstrate appeal across multiple age groups as, during one play session, it may be used by a young child with push or battery-operated trains, while during a later play session, it may be used by an older child or adult for electric toy train operation.

[0025] One or both of the guiderails can be omitted. For example, in one embodiment, one guiderail can be provided on the adapter(s) that restricts lateral movement of a set of wheels of a vehicle placed thereon in conjunction with an outer rail. Alternatively, in another embodiment pertaining to 2-rail toy train tracks, a single guiderail can be centrally provided to restrict lateral movement of the set of wheels of the vehicle, wherein the difference between the width of the guiderail and the distance between the wheels determines how much lateral movement is permitted. Still further, where the travel surface(s) of the adapter(s) is positioned sufficiently below the height of the outer rails, the outer rails themselves (or even the center rail) can provide sufficient guidance for a vehicle placed thereon.

[0026] In still further embodiments, the adapters are furnished with features to provide their easy removal from the track segments without disassembly of the track. For example, the adapters are provided with a slot between the guiderail and the center rail to allow a flathead screwdriver to pry the adapters off of the track.

[0027] In order to provide a more secure fit between the adapters and the track segments, the adapters can be dimensioned to friction-fit between adjacent rails. Further, the adapters can be interconnected at their ends, or

fixed into place using suitable fasteners, including nails, screws, clips and various adhesives.

5 **[0028]** Figure 10 shows yet a further embodiment, wherein adapters are provided that fit the toy train track segments to convert the track for sole use by a second set of other powered or unpowered vehicles of a different gauge. In this embodiment, since the adapters may sit above the rails, the adapters may be provided on their support surfaces with clips or other suitable fasteners for attaching the adapters to the track below.

10 **[0029]** A second train track can be provided with the adapters. In this scenario, the adapters can be integrally formed or can be inlaid with metal or other suitable rails.

[0030] Different support surfaces can be provided for the adapters to accommodate various roadbed features associated with different track manufacturers and sets.

15 **[0031]** It can be appreciated that the concepts herein described can be extended to other track formats including tracks of different gauge as well as configuration (i.e. straight sections, curves, cross-overs, etc.).

20 **[0032]** The above-described embodiments of the invention are intended to be examples of the present invention and alterations and modifications may be effected thereto, by those of skill in the art, without departing from the scope of the invention which is defined solely by the claims appended hereto.